Uniform Distribution

In statistics, uniform distribution refers to a type of probability distribution in which all outcomes are equally likely. Probability distributions can help you decide the probability of a future event.

Continuous Uniform Distribution

Continuous uniform distributions have infinite distribution possibilities. An idealized random number generator would be considered a continuous uniform distribution. With this type of distribution, every point in the continuous range between 0.0 and 1.0 has an equal opportunity of appearing, yet there is an infinite number of points between 0.0 and 1.0.

Example

The number of candies sold daily at a shop is uniformly distributed with a maximum of 40 candies and a minimum of 10.
   1. Probability of daily sales to fall between 15 and 30

$$P\left(15 \leq X \leq 30\right) = (X_2 - X_1) * \frac{1}{b-a}$$

$$P\left(15 \leq X \leq 30\right) = (30 - 15) * \frac{1}{40-10} = 0.5$$

Discrete Uniform Distribution

The possible results of rolling a die provide an example of a discrete uniform distribution. It is possible to roll a 1, 2, 3, 4, 5, or 6, but it is not possible to roll a 2.3, 4.7, or 5.5. Therefore, the roll of a die generates a discrete distribution with the probability of 1/6 for each outcome. There are only 6 possible values to return and nothing in between. The possibilities are finite.

Example

There are 52 cards in a traditional deck of cards. Also in that deck are four suits: hearts, diamonds, clubs, and spades. Each suit contains an A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K. The deck contains 2 jokers, as well. However, we'll ignore the jokers and face cards for this example, and focus only on number cards replicated in each suit. As a result, we are left with 40 cards, a set of discrete data.

Suppose you want to know the probability of pulling a 2 of hearts from the modified deck. The probability of pulling a 2 of hearts is 1/40 or 2.5%. Each card is unique; therefore, the likelihood that you will pull any one of the cards in the deck is the same.

Now, let's consider the likelihood of pulling a heart from the deck. The probability is significantly higher. Why? We are now only concerned with the suits in the deck. Since there are only four suits, pulling a heart yields a probability of 1/4 or 25%.